

If
Receipt

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Allen III et al.

Art Unit : 1732

Serial No. : 10/511,224

Examiner : Unknown

Filed : June 28, 2005

Title : MULTISTEP SEPARATION OF PLASTICS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CORRECTED OFFICIAL FILING RECEIPT

Please correct the Filing Receipt for the above-referenced application to include the correct domestic priority data:

This application is a 371 of PCT/US03/11642, filed 04/14/2003,
which claims benefit of 60/372,001, filed 04/12/2002,
and claims benefit of 60/397,948, filed 07/22/2002,
and claims benefit of 60/397,808, filed 07/22/2002,
and claims benefit of 60/397,953, filed 07/22/2002,
and claims benefit of 60/397,980, filed 07/22/2002.

Please supply a corrected Filing Receipt to the undersigned with respect to this application. A copy of the original Filing Receipt showing the desired changes is attached for your convenience. Also enclosed is a copy of the Combined Declaration & Power of Attorney as filed on June 28, 2005, and a copy of the Preliminary Amendment as filed October 12, 2004, which include the correct domestic priority information.

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I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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9-27-05

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CARLOS A. BRASIL


Applicant : Allen III et al.
Serial No. : 10/511,224
Filed : June 28, 2005
Page : 2 of 2

Attorney's Docket No.: 10887-010US2

No fee is believed to be due. If, however, there are any charges or credits, please apply them to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 9/27/05


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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/511,224	06/28/2005	1732	873	10887-010US2	25	57	1

CONFIRMATION NO. 2121

26181

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FILING RECEIPT



OC000000017007760

Date Mailed: 09/20/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Laurence E. Allen III, San Rafael, CA;
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 Ron C. Rau, Oakland, CA;
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Power of Attorney: The patent practitioners associated with Customer Number 26181.

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US03/11642 04/14/2003
 which claims benefit of 60/372,001 04/12/2002
 and claims benefit of 60/397,948 07/22/2002
 and claims benefit of 60/397,808 07/22/2002, and claims benefit of 60/397,953 07/22/2002
 and claims benefit of 60/397,980 07/22/2002

Foreign Applications

Projected Publication Date: 12/22/2005

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ******Title**

Multistep separation of plastics

Preliminary Class

264

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process simplifies the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

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Title 37, Code of Federal Regulations, 5.11 & 5.15**

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Attorney's Docket No.: 10887-010US2

COMBINED DECLARATION AND POWER OF ATTORNEY

COPY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled MULTISTEP SEPARATION OF PLASTICS, the specification of which:

- ☐ is attached hereto.
☐ was filed on _____ as Application Serial No. _____
☒ was described and claimed in PCT International Application No. PCT/US03/11642 filed on April 14, 2003.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim the benefit under Title 35, United States Code, §119(e)(1) of any United States provisional application(s) listed below:

U.S. Serial No.	Filing Date	Status
60/372,001	04/12/2002	Abandoned
60/397,948	07/22/2002	Abandoned
60/397,808	07/22/2002	Abandoned
60/397,953	07/22/2002	Abandoned
60/397,980	07/22/2002	Abandoned

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information I know to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

U.S. Serial No.	Filing Date	Status
N/A		

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

Country	Application No.	Filing Date	Priority Claimed
WIPO	PCT/US03/11642	04/14/2003	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Combined Declaration and Power of Attorney

Page 2 of 3 Pages

I hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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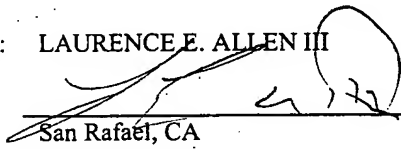
Direct all telephone calls to JENNIFER A. ZANOLCO at telephone number (650) 839-5070.

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PTO Customer Number

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Full Name of Inventor: LAURENCE E. ALLEN III

Inventor's Signature: 

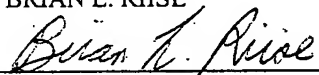
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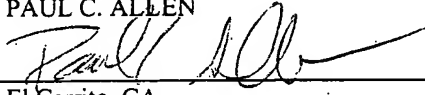
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Combined Declaration and Power of Attorney

Page 3 of 3 Pages

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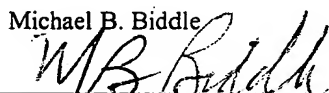
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Attorney's Docket No.: 10887-010US2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

COPY

Applicant : Allen III et al.

Art Unit : Unknown

Serial No. : Unassigned

Examiner : Unknown

Filed : October 12, 2004

Title : MULTISTEP SEPARATION OF PLASTICS

MAIL STOP PCT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as indicated on the following pages.

CERTIFICATE OF MAILING BY EXPRESS MAIL

Express Mail Label No. EV 321 390 993 US

October 12, 2004

Date of Deposit

Applicant : Allen III et al.
Serial No. : Unassigned
Filed :
Page : 2 of 15

Attorney's Docket No.: 10887-010US2

Amendments to the Specification:

Please replace the paragraph beginning at page 1, line 1 with the following amended paragraph:

Insert marked up version of paragraphs here

This application claims the benefit of Provisional Application ~~Serial Numbers~~No. 60/372,001, filed April 12, 2002, 60/397,948, filed July 22, 2002, 60/397,808, filed July 22, 2002, 60/397,953, filed July 22, 2002 and 60/397,980, filed July 22, 2002 which ~~is~~are incorporated by reference herein. This application is also related to ~~U.S.~~ International Application Serial No. PCT/US03/11602, titled "Compositions of Materials Containing Recycled Plastics" to L.E. Allen, III, B.L. Riise, Ron C. Rau and R. C. Raue~~Michael B. Biddle~~, filed on April 14, 2003, which is also incorporated by reference herein.

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-14. (Cancelled)

15. (New) A plastic recycling process, comprising:

receiving a plastic-rich mixture;

determining the plastic-rich mixture to have one or more properties;

selecting one or more processes for processing the plastic-rich mixture, wherein the selection is based on the one or more properties of the plastic-rich mixture, the processes being selected from the group consisting of preprocessing operations, size reduction operations, gravity concentration operations, color sorting, sorting by thickness, friction, or differential terminal velocity or drag in air, surface to mass control operations, separation processes enhanced by narrow surface to mass distributions, blending operations, and extrusion and compounding operations;

arranging the selected processes into a sequence of processes, wherein the sequence is based on the one or more properties;

subjecting the plastic-rich mixture to the sequence of processes; and

collecting a recycled plastic material as an output of the sequence of processes.

16. (New) The process of claim 15, wherein:

selecting the processes includes determining a desired recycled plastic material and selecting the processes to cause the recycled plastic material to include the desired recycled plastic material.

17. (New) The process of claim 15, wherein:
selecting the one or more processes includes selecting at least four processes.
18. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to the sequence of processes includes separating the plastic-rich mixture into different grades of plastic material.
19. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to the sequence of processes includes separating the plastic-rich mixture into different types of plastic material.
20. (New) The process of claim 15, further comprising:
selecting the plastic-rich mixture from a source selected from the group consisting of white goods, office automation equipment, consumer electronics, automotive shredder residue, packaging waste, household waste, building waste, industrial molding and extrusion scrap according to one or more desired properties of the recycled plastic material.
21. (New) The process of claim 15, further comprising:
selecting the plastic-rich mixture based on a geographic location of origin of the plastic-rich mixture.
22. (New) The process of claim 15, wherein:
selecting the plastic-rich mixture includes determining one or more desired properties of the recycled plastic material.
23. (New) The process of claim 15, wherein:
one or more of the processes is repeated in the sequence of processes.

24. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes blending two or more materials to obtain a desired property in the recycled plastic material, wherein at least one of the materials is a product of one of the processes.
25. (New) The process of claim 15, further comprising:
compounding the recycled plastic material with one or more additives.
26. (New) The process of claim 15, wherein:
collecting a recycled plastic material as an output of the sequence of processes includes collecting a plurality of recycled plastic materials.
27. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes reducing the average size of plastic particles in the sequence of processes from about 75 mm to less than about 8 mm.
28. (New) The process of claim 27, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes reducing the average size of plastic particles in the sequence of processes over a plurality of processes in the sequence of processes.
29. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a preprocessing operation before a size reduction operation.

30. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a preprocessing stage including air aspiration.

31. (New) The process of claims 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to one or more wet granulation size reduction operations.

32. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to one or more gravity concentration operations.

33. (New) The process of claim 32, wherein:
subjecting the plastic-rich mixture to one or more gravity concentration operations includes subjecting the plastic-rich mixture to a gravity concentration operation using solid particle media.

34. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to one or more truncated cone hydrocyclones or elutriators to remove metal or non-target plastics from the plastic mixture.

35. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to an arrangement of three consecutive gravity operations.

36. (New) The process of claim 35 wherein:

subjecting the plastic-rich mixture to an arrangement of three consecutive gravity concentration operations includes subjecting the plastic rich mixture to a modified hydrocyclone to remove metal, a modified hydrocyclone to remove high density plastics and a hydrocyclone to separate low from medium density plastics.

37. (New) The process of claim 15, wherein:

receiving a plastic-rich mixture includes receiving a plastic-rich mixture including HIPS, ABS and SAN;

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a gravity concentration operation to create a first stream having a higher percentage of HIPS than the plastic-rich mixture and a second stream having a higher percentage of ABS and SAN than the plastic-rich mixture and the first stream.

38. (New) The process of claim 15, wherein:

receiving a plastic-rich mixture includes receiving a plastic-rich mixture including a first grade of a first plastic type and a second grade of the first plastic type; and

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a gravity concentration operation to create a first product stream and a second product stream, wherein the first product stream has a higher percentage of the first grade of the first plastic type than the plastic-rich mixture and the second product stream has a higher percentage of the second grade of the first plastic type than the plastic-rich mixture and the first product stream.

39. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to sorting by thickness or friction.

40. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a sliding chute device that removes rubber.
41. (New) The process of claim 15, wherein:
receiving a plastic-rich mixture includes receiving a plastic-rich mixture including HIPS and one or more of PP, ABS, general purpose PS or contaminants;
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to sorting by thickness or friction; and
collecting a recycled plastic material includes collecting a stream including a higher percentage of HIPS than the plastic-rich mixture and one or more streams including PP, ABS, general purpose PS, or contaminants.
42. (New) The process of claim 15, wherein:
receiving a plastic-rich mixture includes receiving a plastic rich mixture including ABS and one or more of SAN, HIPS or contaminants;
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to sorting by thickness or friction; and
collecting a recycled plastic material includes collecting a stream including a higher percentage of ABS than the plastic-rich mixture and one or more streams including SAN, HIPS or contaminants.
43. (New) The process of claim 15, wherein:
subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a surface to mass control operation.

44. (New) The process of claim 43, wherein:

subjecting the plastic-rich mixture to a surface to mass control operation includes one or more of a size reduction operation, an air aspiration, sorting using thickness or friction, a roll sorter, or a combination thereof.

45. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a gravity concentration operation to create one or more streams of plastic material, followed by a triboelectrostatic separation of one of the one or more streams of plastic material.

46. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a surface to mass separation process to recover a plurality of products and subjecting at least one of plurality of products to triboelectrostatic separation.

47. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a triboelectrostatic separation.

48. (New) The process of claim 47, wherein:

subjecting the plastic-rich mixture to a triboelectrostatic separation includes subjecting the plastic-rich mixture to a triboelectrostatic separation in which a charge mediating material is added.

49. (New) The process of claim 47, wherein:

subjecting the plastic-rich mixture to a triboelectrostatic separation includes tuning a triboelectrostatic separator, including selecting a geometry of the triboelectrostatic separator,

selecting a charge of charge plates of the triboelectrostatic separator, selecting an angle of the charge plates, or selecting a voltage applied to the charge plates.

50. (New) The process of claim 47, wherein:
subjecting the plastic-rich mixture to a triboelectrostatic separation includes
subjecting the plastic-rich mixture to two or more triboelectrostatic separators in series.

51. (New) The process of claim 47, wherein:
subjecting the plastic-rich mixture to a triboelectrostatic separation includes
feeding one or more product streams from a first stage triboelectrostatic separator back into the
first stage triboelectrostatic separator.

52. (New) The process of claim 47, wherein:
subjecting the plastic-rich mixture to a triboelectrostatic separation includes
feeding one or more product streams from a second stage triboelectrostatic separator to a first
stage triboelectrostatic separator.

53. (New) The process of claim 47, wherein:
subjecting the plastic-rich mixture to a triboelectrostatic separation includes
subjecting one or more product streams from a triboelectrostatic separator to a surface to mass
control operation, followed by subsequent a triboelectrostatic separation.

54. (New) The process of claim 15, wherein:
receiving a plastic-rich mixture includes receiving a mixture of ABS and HIPS;
and
collecting a recycled plastic material includes collecting a first output and a
second output, wherein the first output has a higher percentage of ABS than the plastic-rich
mixture and the second output has a higher percentage of HIPS than the plastic-rich mixture.

55. (New) The process of claim 15, wherein:

receiving a plastic-rich mixture includes receiving a mixture including a first plastic type, wherein a first portion of the first plastic type has a first property and a second portion of the first plastic type has a second property; and

collecting a recycled plastic material includes collecting a first output and a second output, wherein the first output includes a higher percentage of the first plastic type than the plastic-rich mixture and the second output includes a higher percentage of the second plastic type than the plastic-rich mixture and the first output.

56. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a process that separates the plastic-rich mixture into a plurality of product streams including a first stream of a first plastic type having a first surface to mass and a second stream of the first plastic type having a second surface to mass and blending the first and second streams to combine the first stream with the second stream.

57. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a triboelectrostatic separation; and

collecting a recycled plastic material includes collecting a first output and a second output, wherein the first output includes ABS and the second output includes SAN, the first output has a lower percentage of SAN than the second output and the second output has a lower percentage of ABS than the first output.

58. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a blending operation that combines a first stream including ABS with a second stream including SAN.

59. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a triboelectrostatic separation to separate PC and ABS from flame retarded ABS subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a triboelectrostatic separation to separate a PC/ABS blend from flame retarded ABS.

60. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a triboelectrostatic separation to separate flame retarded HIPS from non-flame retarded HIPS.

61. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to a blending operation.

62. (New) The process of claim 15, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes subjecting the plastic-rich mixture to extrusion compounding.

63. (New) The process of claim 62, wherein:

subjecting the plastic-rich mixture to extrusion compounding includes subjecting the plastic-rich mixture to extrusion compounding with screen packing.

64. (New) The process of claim 62, wherein:

subjecting the plastic-rich mixture to extrusion compounding includes subjecting the plastic-rich mixture to extrusion compounding with two or more stages of screen packing with increasingly finer mesh screening.

65. (New) The process of claim 15, wherein:

receiving a plastic-rich mixture includes receiving a plastic containing bromine;

and

collecting a recycled plastic material includes collecting a first output including at least a portion of the plastic containing bromine and collecting a second output substantially free of the plastic containing bromine.

66. (New) The process of claim 65, wherein:

subjecting the plastic-rich mixture to a sequence of processes includes one or more of gravity concentration, color sorting, detecting and selectively ejecting materials containing bromine, triboelectrostatic separation or thickness sorting.

67. (New) The process of claim 15, wherein:

collecting a recycled plastic material includes collecting engineering thermoplastics.

68. (New) The process of claim 15, wherein selecting the one or more processes and arranging the selected processes into a sequence of processes creates the sequence of processes to include:

a preprocessing operation, followed by a size reduction operation, followed by a gravity concentration operation, followed by a triboelectrostatic separation.

69. (New) The process of claim 15, wherein selecting the one or more processes and arranging the selected processes into a sequence of processes creates the sequence of processes to include:

a size reduction operation, followed by a gravity concentration operation, followed by a triboelectrostatic separation.

70. (New) The process of claim 15, wherein selecting the one or more processes and arranging the selected processes into a sequence of processes creates the sequence of processes to include:

a preprocessing operation, followed by a size reduction operation, followed by a gravity concentration operation, followed by a triboelectrostatic separation.

71. (New) The process of claim 15, wherein selecting the one or more processes and arranging the selected processes into a sequence of processes creates the sequence of processes to include:

a size reduction operation, followed by a gravity concentration operation, followed by a surface to mass control operation, followed by a triboelectrostatic separation.

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REMARKS

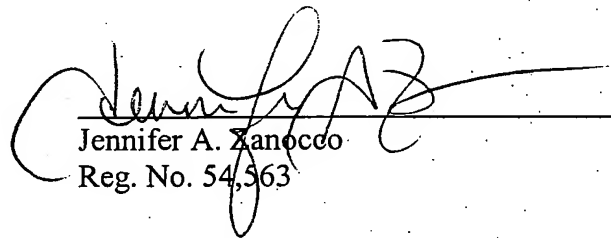
Applicant asks that all claims be examined in view of the amendment to the claims.

Please apply any appropriate charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date:

Oct 12, 2007



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